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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,049	03/02/2004	Xiaorong Wang	P03002US1A	2827
27885	7590	12/22/2006	EXAMINER	
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP			ASINOVSKY, OLGA	
1100 SUPERIOR AVENUE, SEVENTH FLOOR			ART UNIT	PAPER NUMBER
CLEVELAND, OH 44114			1711	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE		DELIVERY MODE	
3 MONTHS	12/22/2006		PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/791,049	WANG ET AL.	
	Examiner Olga Asinovsky	Art Unit 1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 20 October 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 10-17 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 10-17 and 23 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 March 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 12 pages, 4/26/04; 10/13/04; 9/22/05

4) Interview Summary (PTO-413)

Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application

6) Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II, claims 10-17 in the reply filed on October 20, 2006 is acknowledged.

Claim Rejections - 35 USC § 112

2. Claims 10 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Chemical formulations of a mono-block polymer and a di-block polymer are indefinite in claim 10.

3. Regarding claim 13, the phrase "and the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "and the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 10-15, 17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krom et al U.S. Patent 6,437,050 in view of Demirors et al U.S. Patent 6,441,090.

Applicants amend claim 10 by including that "said nanoparticles have a size distribution that is polymodal."

Reference to Krom et al has been considered in the previous office action mailed on 06/20/2006.

Krom discloses polymer nanoparticles having a dispersity index less than about 1.3, more preferably less than about 1.1, column 2, lines 14-15. Krom discloses a cross-linking agent such as DVB, which has a crosslinking effect to the double bond in a block polymer, column 3, line 20-34. The cross-linking effect is within the scope of hydrogenation effect to the vinyl moiety.

Krom discloses a di-block copolymer produced by living anionic polymerization, col. 2, lines 51-65. The diblock copolymer is formed in micelles form, col. 3, line 15. After the micelles have formed, additional conjugated diene monomer or vinyl-substituted aromatic hydrocarbon monomer can be added, col. 3, lines 16-18. Therefore, said additional monomer is polymerized for producing a homopolymer, wherein said homopolymer is readable as applicants' named a mono-block polymer. The type of said additional monomer is a choice for being a conjugated diene monomer or vinyl-substituted aromatic hydrocarbon monomer. A mono-block polymer in the present claim 10 is open to any chemical formulation and said mono-block polymer is readable in Krom invention.

A chemical formulation of the claimed mono-block polymer and chemical formulation of a diblock polymer in the present claim 10 is open to any monomer(s) recited in part (a).

Demirors discloses a rubber modified monovinylidene aromatic polymer having a bimodal rubber particle size distribution, column 6, lines 18-30, having a small rubber particles in the range of 100 to 200 nanometer and large rubber particles having range of from 500 to 1000 nanometer.

Both references disclose the analogous anionic polymerization process. It would have been obvious to one of ordinary skill in the art to modify the polymer nano-particle composition in Krom invention by employing of the bimodal rubber polymer particles by teaching in Demirors invention, since the desired bimodal rubber particle size distribution is depending on the techniques of mass-polymerization and the conditions needed for producing the desired average particle sizes and the desired property of the resulting polymer composition, and since both references disclose the rubbery formation unit.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krom et al U.S. Patent 6,437,050 in view of Demirors et al U.S. Patent 6,441,090 as applied to claims 10-15, 17 and 23 above, and further in view of Coolbaugh et al U.S. Patent 5,399,629 or Wang et al U.S. Patent 6,689,469.

7. Krom does not disclose hydrogenating of conjugated diene monomer units. Coolbaugh discloses a selective hydrogenation of a thermoplastic block copolymer elastomer based on conjugated diene monomers by using a hydrogenation catalyst. Wang et al'469 discloses a polymer nano-particle composition comprising a poly(alkenylbenzene) core=mono-block polymer and diblock polymer formed of vinyl aromatic hydrocarbon monomer and diene monomer. The polydiene units are

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hydrogenated, column 5, lines 6-14. The nano-particles have a polydispersity less than about 1.3, column 7, claim 9.

8. It would have been obvious to one of ordinary skill in the art to produce a hydrogenated polyconjugated diene chain in Krom invention by using a hydrogenated catalyst as disclosed by Coolbaugh invention or Wang et al'6,689,469, since each reference discloses similar conjugated diene units.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 10-17 and 23 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,872,785 in view of Demirors et al U.S. Patent 6,441,090. The chemical formulation of

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a multi-layer nano-particle composition in claims 1-18 of Patent 6,872,785 is directly overlapping the chemical formulation of a polymer nanoparticle composition in the present claims. Applicants amend claim 10 by including that nanoparticles have a polymodal size distribution. Claims 1-18 of Patent 6,872,785 does not disclose a polymodal particles size distribution. Also, claims 1-18 of Patent 6,872,785 does not claim a polydispersity index in the range of 1.15 and 8.0. Taken the disclosure of Patent 6,872,785 as a dictionary, it was found that the polydispersity index is 1.10 in the Example 1 at column 13, line 44.

11. Demirors discloses a rubber modified monovinylidene aromatic polymer having a bimodal rubber particle size distribution, column 6, lines 18-30, having a small rubber particles in the range of 100 to 200 nanometer and large rubber particles having range of from 500 to 1000 nanometer.

12. It would have been obvious to one of ordinary skill in the art to modify the polymer nano-particle composition in the present claims by employing of the bimodal rubber polymer particles by teaching in Demirors invention, since the desired bimodal rubber particle size distribution is depending on the techniques of mass-polymerization and the conditions needed for producing the desired average particle sizes and the desired property of the resulting polymer composition, and since the present claims are open to any polymerization technique.

13. Claims 10-17 and 23 are rejected under 35 U.S.C. 103(a) as being obvious over Wang et al U.S. Patent 6,872,785 in view of Demirors et al U.S. Patent 6,441,090.

The applied reference has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2). See explanation in the paragraphs 10-12 above.

Response to Arguments

14. Applicant's arguments with respect to claim 10 have been considered but are moot in view of the new ground(s) of rejection.

Considering the argument about diblock copolymer, the examiner is noted that the part (a) in claim 10 recites "first monomer unit selected from the group consisting of alkenylbenzenes, conjugated dienes, alkynes and mixture thereof." Any monomer can

be selected for producing a mono-block polymer. The mixture of these monomers creates a di-block copolymer, the examiner agrees. It is not clear that an outer layer contains a mono-block polymer. There is no requirement in part (b) that the first monomer is other than alkenylbenzene monomer, since an alkenylbenzene is already present as a second monomer for making an inner layer.

Applicants argue that Krom does not disclose polymodal particles size distribution. The examiner agrees. However, the size of particles distribution is depending on a process condition referring to a secondary reference to Demirors et al.

Second argument is that the present polymer nanoparticle composition comprises a mono-block and diblock polymer chains.

Krom reference does not use term "mono-block polymer." However, the additional conjugated diene monomer or vinyl-substituted aromatic hydrocarbon monomer can be added after the formation of micelles, col. 3, lines 16-18, for producing a homopolymer, which is readable for being a mono-block polymer.

In light of the new rejection this action is not final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is 571-272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D.A
December 14, 2006



James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700